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09/301,885	04/29/1999	DARRELL R. COMMANDER	1857-00200	6193

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EXAMINER
ALI, SYED J

ART UNIT	PAPER NUMBER
2127	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/301,885	Applicant(s) COMMANDER, DARRELL R.	
	Examiner Syed J Ali	Art Unit 2127	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: . .

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 4-6, 29, and 30 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 4 recites the limitation "the parallel processing logic of claim 3" in line 1. There is insufficient antecedent basis for this limitation in the claim.

Claim 5 recites the limitation "the parallel processing logic of claim 3" in line 1. There is insufficient antecedent basis for this limitation in the claim.

Claim 6 recites the limitation "the model parameter" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim 29 recites the limitation "step (a)" in lines 4 and 5. There is insufficient antecedent basis for this limitation in the claim.

Claim 30 recites the limitation "step (a)" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

3. Claims 1-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Blelloch et al. (USPN 5,768,594) (hereinafter Blelloch).

As per claim 1, Blelloch discloses a parallel processing network in which one or more processes can be spawned, comprising:

a plurality of computers coupled together by a communication link (col. 2 lines 14-63, "a system SY1 containing processing elements PE1 and a router RT1 shown in Fig. 2", wherein this system is one of a plurality that work together to accomplish the parallel processing goal, and it is well known that a router constitutes a communication link between nodes on a network);

Blelloch does not specifically disclose that the process spawning logic should be included in one of said plurality of computers, or that the processes should be spawned automatically in response to user specified criteria. Rather, Blelloch makes use of an assignment manager to control the process spawning logic (col. 2 lines 28-36, "an assignment manager AM1 determines tasks available for scheduling and assigns a subset of these tasks to a system"), which provides an advantage over what is claimed in the sense that one of the computers involved in the parallel processing is not burdened with the computation necessary to perform the process spawning logic. It would have been obvious to one of ordinary skill in the art to place this logic within one of the computers on the network for the purpose of reducing overhead by reducing the number of

machines, however it is not clear that the advantage gained therein overcomes the computational burden presented.

In addition, Blelloch's method does not spawn processes automatically in response to user specified criteria. Rather, Blelloch's method allows the system to manage its own resource, and does spawn processes automatically according to what the assignment manager knows about the network features (col. 2 lines 28-36, col. 4 lines 14-44). It would have been obvious to one of ordinary skill in the art to take control at least partially away from the system and give it to a user for the purpose of allowing the user to modify the usage of the network as deemed necessary. However, the method of Blelloch could easily have implemented such a feature, but provides a further advantage by taking control away from the user, and thus reducing the chance for human error.

As per claim 2, Blelloch does not specifically teach that the communications link includes a switch. However, Blelloch does teach the use of a router to control network traffic (col. 2 lines 28-63). The use of a switch in a computer network is to alleviate congestion and reduce the chance of network collisions. This is an implementation choice, and provides quite an advantage in a network of a large number of nodes. However, for smaller networks a switch would provide a minimal advantage. It would have been obvious to one of ordinary skill in the art to use a switch in the method of Blelloch for a network with a large number of nodes or network traffic. The use of switches is well known in the art and a network engineer of ordinary skill would know to use one if network congestion needed to be alleviated.

As per claim 3, Blelloch does not specifically teach that the number of processes the spawning logic should spawn comes from user specified criteria. However, the advantages of user specified criteria are addressed above. Hereinafter, the issue of user specified criteria should be considered covered by the discussion of claim 1. Additionally, Blelloch does teach a limitation on the number of processes the spawning logic should spawn (col. 4 lines 14-44, "the assignment manager AM1 selects some number N of available tasks").

As per claim 4, Blelloch does not specifically disclose that the user specified criteria also includes a model parameter. This is mostly due to the fact that the emphasis in Blelloch is how the scheduler performs and how the processes are spawned to different processing elements. Factors such as the model of CPU is of minimal importance, and do not impact the operation of the scheduler significantly. Therefore, no considerable advantage is presented by including a model parameter, and thus it is not considered patentable.

As per claim 5 and 19, Blelloch discloses that the user specified criteria also includes a maximum number of CPUs to be used per machine to execute processes (col. 4 lines 14-44, "the assignment manager AM1 partitions the N selected tasks to p groups of size approx (N/p) each, where p is the number of available processing elements PE1").

As per claims 6 and 12, Blelloch discloses that each of the plurality of computers includes a CPU (fig. 3 element PR1, wherein Blelloch covers the issue of distributing processes over processing elements, and fig. 3 shows that a processing element [PE] includes a CPU

[processor PR1, where a processor is the equivalent of a CPU]). The model parameter limitation is discussed above in the rejection of claim 4 and is thus covered.

As per claim 7, Blelloch discloses that the user specified criteria include a resource parameter (fig. 3 element RT1, wherein the router interface is a parameter telling the processing element how to find resources on the network).

As per claims 8 and 13, Blelloch discloses the each of said plurality of computers includes a network interface (fig. 3 element RT1) and the resource parameter refers a type of network interface (see above discussion in claim 7). To say that the network features include the type of network interface resource is considered analogous.

As per claim 9, Blelloch discloses that the process spawning logic compares the user specified criteria to network features (col. 4 lines 14-44, where the assignment manager checks the available resources on the network and spawns processes according to what is available automatically, and distributes tasks accordingly).

As per claim 10, Blelloch does not specifically disclose that the network features are maintained in a process scheduler included in one of said plurality of computers. However, as discussed in the rejection of claim 1, an assignment manager controls these details (col. 4 lines 14-44). The motivation for including the network features in one of the computers involved in

the parallel processing as well as the reasons why it may not provide an advantage are discussed above.

As per claim 11, Blelloch discloses that the network features include identification of which of said plurality of computers is operational and which are nonoperational and the spawning logic (col. 2 lines 1-63, col. 4 lines 14-44, "the assignment manager AM1 partitions the N selected tasks to p groups of size approx (N/p) each, where p is the number of available processing elements PE1", wherein the assignment manager keeps track of which processing elements are available, thus also keeping track of which processors are operational. Further, the assignment manager is responsible for distributing tasks amongst parallel processors, and thus includes the spawning logic necessary to perform those functions.)

As per claims 14, 22, 23, and 26, Blelloch does not specifically disclose that the user specified criteria includes a number of processes to be spawned and, if said spawning logic determines there are insufficient network features to spawn processes in accordance with the user specified criteria, the spawning logic spawns fewer processes than the user specified number of processes. However, Blelloch does include a mechanism for accounting for a potential lack of network features. Specifically, the processes to be distributed amongst processing elements are distributed in groups, and then assigned to task buffers. Therefore, the assignment manager takes into account the number of available processing units and divides the tasks accordingly. This may provide an advantage over the claimed invention since the process can still be divided into as small of subtasks as desired without having to reduce the number of tasks spawned.

However, it would have been obvious to one of ordinary skill in the art to simply reduce the number of processes spawned if the intended goal was to distribute all processes at once without also managing task buffers and other such factors. This would reduce the number of things to consider and make managing of the scheduler simpler, but perhaps at a cost of efficiency. To say that the network has insufficient CPUs to spawn the user desired number of processes is considered the equivalent of saying that the network has insufficient features to support the same action.

As per claim 15, Blelloch discloses a parallel processing network, comprising:

a plurality of processors coupled together by a communications link (figs. 2, 3, col. 2 lines 14 – col. 3 line 12, wherein a processor is shown to be a portion of a processing element that is connected to a network through a router interface, an example of a communications link);

a process scheduler accessible by at least one of said processors (col. 3 lines 38-50, "the invention utilizes the ordering of tasks in the sequential scheduling to select a subset of the available tasks for parallel processing"), said process scheduler maintains a list of network features (col. 4 lines 14-44, wherein the scheduler resides in the assignment manager which is responsible for keeping track of the features of the network so that conditions for the proper distribution of tasks is maintained);

spawning logic coupled to said process scheduler (col. 3 line 50 – col. 4 line 44, col. 11 line 12 – col. 12 line 63, wherein the idea of process spawning is described specifically as it relates to the invention of Blelloch, and the spawning logic is part of the process scheduler which resides in the assignment manager);

Blelloch does not specifically state that said spawning logic receives a set of parameters from a user that determine how processes are to be spawned by the root machine. Rather, process spawning is handled by the assignment manager and done so automatically rather than in response to input from a user. The motivation for granting or removing control from the user is discussed above. Additionally, that the set of parameters including a user desired number of processes to be spawned, said spawning logic determines whether sufficient network features are available to permit the user desired number of processes to be spawned in accordance with the use specified parameters is discussed above as well.

As per claim 16, it is rejected for similar reasons as discussed above in the rejections of claims 4 and 6.

As per claim 17, it is rejected for similar reasons as discussed above in the rejections of claims 7 and 8.

As per claim 18, Blelloch discloses that the spawning logic determines whether sufficient network features are available to permit the user desired number of processes to be spawned by accessing the process scheduler to read the list of network features (col. 4 lines 14-44, wherein the assignment manager houses the process scheduler and determines how to distribute the processes to be spawned based on how many processing elements are available and dividing the processes into groups accordingly).

As per claim 20, Blelloch discloses a computer readable storage medium for storing an executable set of software instructions which, when inserted into a host computer system, is capable of controlling the operation of the host computer, said software instructions being operable to automatically spawn parallel processes in a parallel processing network (col. 2 line 28 – col. 4 line 44, wherein the assignment manager is considered the host computer which stores the instructions and controls the parallel processing distribution), comprising:

a means for reading a process scheduler to access a list of features associated with the parallel processing network (col. 3 line 38 – col. 4 line 44, wherein the assignment manager reads the process scheduler and maintains the network features and distributes processes to processing elements according to predetermined criteria);

a means for spawning processes (col. line 38 – col. 4 line 44, col. 11 line 11 – col. 12 line 63, wherein the concept of process spawning is described as it applies to the invention of Blelloch);

Blelloch does not specifically disclose a means for receiving user specified criteria; or

a means for comparing the list of network features to the user specified criteria.

However, Blelloch rather utilizes an assignment manager to automate these functions and the benefit of user specified criteria is discussed above.

As per claims 21 and 25, they are rejected for similar reasons stated above in the discussion of claim 15.

As per claim 24, Blelloch discloses a method of creating processes in a multi-processor network, comprising:

(a) receiving criteria that determine how the processes are to be created, the criteria including a desired number of processes to be created (col. 4 lines 14-44, "AM1 selects some number N of available tasks");

Blelloch does not specifically disclose the step of:

(b) comparing the criteria to a database of network features to determine if there are a sufficient number of processors to accommodate the desired number of processes;

However, Blelloch does disclose evaluating the number of processors (processing elements) available to determine how to distribute processes for computation (col. 4 lines 14-44). It would have been obvious to one of ordinary skill in the art to store such information in a database since when distributing processes only a simple comparison between a certain flag would need to be executed to determine if a processor is available. However, this comes at a cost since the database would need to be implemented and stored on one of the machines. Blelloch automates this function, giving control of it to an assignment manager to determine which processing elements are available. Thus, although it would have been obvious to store the information in a database, it may not necessarily be an improvement over the art shown in Blelloch since the computation costs may exceed the benefit gained from simplifying the comparison.

Blelloch does show (c) creating processes in accordance with step (b). (col. 3 line 51 – col. 4 line 44).

As per claims 27 and 28, it is rejected for similar reasons as discussed concerning the model of CPU used and resource parameters as discussed in the rejection of claims 6-8.

As per claim 29, Blelloch does not specifically disclose a method for spawning processes in a multiprocessor network, comprising:

specifying whether processes are to be spawned automatically to match a set of criteria or spawned in accordance with a process group file;

Rather, Blelloch always spawns processes automatically in response to whatever the network status currently is. In this sense, Blelloch spawns processes to match a set of criteria. However, Blelloch makes no mention of spawning processes in accordance with a process group file. This is due to the fact that Blelloch intention is to make maximum of use of what the current network status is rather than create a uniform standard by which to treat process spawning. It would have been obvious to one of ordinary skill in the art to spawn processes in accordance with a group file for the purpose of creating a standard, which is always adhered to so that parallel processing always executed in the same manner and would require a minimal amount of maintenance. However, Blelloch provides an advantage over this by completely automating the system and thus eliminating the potential for misuse of resource due to a process group file that may not make the most efficient use of network resources.

The remaining steps of spawning processes to match the criteria if automatic spawning is specified in step (a); or

spawning processes in accordance with the process group file if so specified in step (a) naturally follow the selection of whether to spawn processes automatically or relegate the duties

to a process group file. Therefore, these limitations are considered covered by the discussion above.

As per claim 30, the act of determining whether the multiprocessor network matches the set of criteria if automatic spawning is specified in step (a) is considered equivalent to comparing user specified criteria to network features, as claimed in claim 9. Therefore, the rejection of claim 9 also provides the basis for the rejection of this claim.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Syed J Ali whose telephone number is (703) 305-8106. The examiner can normally be reached on Mon-Fri 8-5:30, 1st Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John A Follansbee can be reached on (703) 305-8498. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 746-7239 for regular communications and (703) 746-7238 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

Syed Ali
December 12, 2002

MAJID A. BANANKHAH
PRIMARY EXAMINER